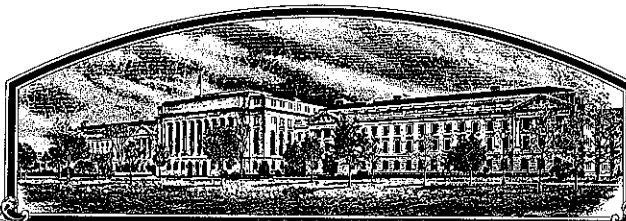


No.



9500272

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Virginia Agricultural Experiment Station

Whereas, THERE HAS BEEN PRESENTED TO THE

Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED DISTINCT VARIETY OF SEXUALLY REPRODUCED, OR TUBER PROPAGATED, PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF TWENTY YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, OR IMPORTING IT, OR EXPORTING IT, OR CONDITIONING IT FOR PROPAGATION, OR STOCKING IT FOR ANY OF THE ABOVE PURPOSES, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT. IN THE UNITED STATES SEED OF THIS VARIETY (1) SHALL BE SOLD BY VARIETY NAME ONLY AS A CLASS OF CERTIFIED SEED AND (2) SHALL CONFORM TO THE NUMBER OF GENERATIONS SPECIFIED BY THE OWNER OF THE VARIETY (84 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

BARLEY

'Starling'

In Testimony Whereof, I have hereunto set my hand and caused the seal of the Plant Variety Protection Office to be affixed at the City of Washington, D.C. this thirtieth day of January in the year of our Lord one thousand nine hundred and ninety-six.

Attest:

Martha A. Hansen
Commissioner
Plant Variety Protection Office
Agricultural Marketing Service

W. L. Glickman
Secretary of Agriculture

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
SCIENCE DIVISION - PLANT VARIETY PROTECTION OFFICE

The following statements are made in accordance with the Privacy Act of 1974 (5 U.S.C. 552a).

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE

(Instructions and information collection burden statement on reverse)

1. NAME OF APPLICANT(S) (as it is to appear on the Certificate) Virginia Agricultural Experiment Station		2. TEMPORARY DESIGNATION OR EXPERIMENTAL NUMBER VA85-44-226	3. VARIETY NAME Starling
4. ADDRESS (Street and No., or R.F.D. No., City, State, and ZIP Code, and Country) Virginia Polytechnic Institute and State Univ. College of Agriculture and Life Sciences 104 Hutcheson Hall Blacksburg, VA 24061-0402		5. TELEPHONE (include area code) 540-231-3766	FOR OFFICIAL USE ONLY PVPO NUMBER 9500272 DATE Aug 11, 1995 FILING AND EXAMINATION FEE \$ 2325.00 + \$125.00 DATE 05/03/95 to 07/31/95 CERTIFICATION FEE \$ 300.00 DATE Nov. 15, 1995
6. FAX (include area code) 540-231-4163		7. GENUS AND SPECIES NAME Hordeum vulgare L.	
8. FAMILY NAME (Botanical) Gramineae		9. CROP KIND NAME (Common name) Winter Feed Barley	
10. IF THE APPLICANT NAMED IS NOT A "PERSON", GIVE FORM OF ORGANIZATION (corporation, partnership, association, etc.) (Common name) Agricultural Experiment Station of Virginia Tech			
11. IF INCORPORATED, GIVE STATE OF INCORPORATION		12. DATE OF INCORPORATION	
13. NAME AND ADDRESS OF APPLICANT REPRESENTATIVE(S), IF ANY, TO SERVE IN THIS APPLICATION AND RECEIVE ALL PAPERS Carl A. Griffey Crop and Soil Environmental Sciences Virginia Tech Blacksburg, VA 24061-0404			14. TELEPHONE (include area code) 540-231-9789
			15. FAX (include area code) 540-231-3431
16. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED (Follow instructions on reverse)			
a. <input checked="" type="checkbox"/> Exhibit A. Origin and Breeding History of the Variety b. <input checked="" type="checkbox"/> Exhibit B. Statement of Distinctness c. <input checked="" type="checkbox"/> Exhibit C. Objective Description of the Variety d. <input checked="" type="checkbox"/> Exhibit D. Additional Description of the Variety e. <input checked="" type="checkbox"/> Exhibit E. Statement of the Basis of the Applicant's Ownership f. <input checked="" type="checkbox"/> Voucher Sample (2,500 viable untreated seeds or, for tuber propagated varieties verification that tissue culture will be deposited and maintained in a public repository) g. <input checked="" type="checkbox"/> Filing and Examination Fee (\$2,450), made payable to "Treasurer of the United States" (Mail to PVPO)			
17. DOES THE APPLICANT SPECIFY THAT SEED OF THIS VARIETY BE SOLD BY VARIETY NAME ONLY, AS A CLASS OF CERTIFIED SEED? (See Section 83(a) of the Plant Variety Protection Act)? <input checked="" type="checkbox"/> YES (If "yes," answer items 18 and 19 below) <input type="checkbox"/> NO (If "no," go to item 20)			
18. DOES THE APPLICANT SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO		19. IF "YES" TO ITEM 18, WHICH CLASSES OF PRODUCTION BEYOND BREEDER SEED? <input checked="" type="checkbox"/> FOUNDATION <input checked="" type="checkbox"/> REGISTERED <input checked="" type="checkbox"/> CERTIFIED	
20. HAS THE VARIETY OR A HYBRID PRODUCED FROM THE VARIETY BEEN RELEASED, USED, OFFERED FOR SALE, OR MARKETING IN THE U.S. OR OTHER COUNTRIES? <input checked="" type="checkbox"/> YES (If "yes," give names of countries and dates) <input type="checkbox"/> NO Foundation seed was sold to certified seed growers in Fall 1994 and certified seed to producers in the U.S.A. in Fall 1995.			
21. The applicant(s) declare that a viable sample of basic seed of the variety will be furnished with application and will be replenished upon request in accordance with such regulations as may be applicable, or for a tuber propagated variety a tissue culture will be deposited in a public repository and maintained for the duration of the certificate.			
The undersigned applicant(s) is(are) the owner(s) of this sexually reproduced or tuber propagated plant variety, and believe(s) that the variety is new, distinct, uniform, and stable as required in Section 41, and is entitled to protection under the provisions of Section 42 of the Plant Variety Protection Act.			
Applicant(s) is(are) informed that false representation herein can jeopardize protection and result in penalties.			
SIGNATURE OF APPLICANT (Owner(s)) R. O. Cannell		SIGNATURE OF APPLICANT (Owner(s)) 02	
NAME (Please print or type) R. O. Cannell		NAME (Please print or type)	
CAPACITY OR TITLE Director, VAES	DATE 9-15-95	CAPACITY OR TITLE	DATE

Starling Barley

14A. Exhibit A: Origin and Breeding History

Genealogy and Breeding History. Starling barley was derived from one of six populations in which C.I. 11550 was used as a parent for tolerance to low pH and aluminum. Development of the initial populations, listed below, was completed in 1977, and seed from F₁ plants of each population was composited and advanced.

Populations

- C.I. 11550/4/'Harrison'/3/'Cebada Capa'/'Wong'/2/Awnleted 'Hudson'/5/VA77-42-35 ('Surry' selection)
- C.I. 11550/4/Harrison/3/Cebada Capa/Wong/2/Awnleted Hudson/5/VA77-42-37 (Surry selection)
- C.I. 11550/Surry/'Monroe'
- C.I. 11550/Surry//VA77-12-39 (C.I.'s 9623, 9658, 9708, BYDV Res. 'Atlas'/Many lines)
- C.I. 11550/Surry//VA76-44-72 ('Jefferson' & Harrison/3/Cebada Capa/Wong//Awnleted Hudson)
- C.I. 11550/5/Harrison/3/Cebada Capa/Wong/2/Awnleted Hudson/4/*3 C.I. 3515 /6/'Henry'

Selection and Advancement of the Variety. The segregating generations of this composite were advanced using a modified bulk breeding method. Starling was selected in the F₆ generation, and was grown in an observation plot in 1985 and designated as VA 85-44-226. This line was first evaluated in replicated yield trials in 1986 and, preceding its release, was evaluated for six years (1987-1992) in the Virginia Small Grains Variety Test.

Multiplication and Purification. Within the limits of biological expectation, Starling has remained stable and uniform in composition through eight generations of selfing. In the 1991-92 crop season, 600 headrows of Starling were planted at Warsaw, Virginia and obvious variants were removed. The remaining headrows were harvested individually, and seed from 315 of these rows was planted separately in 45 ft² plots at the Virginia Foundation Seed Farm in the fall of 1992. Residual seed of these 315 rows were used in greenhouse evaluations to identify any additional variants and as a source of breeder seed for long-term storage. Among the 315 plots, those shown to possess or consist of variants, based on visual observation and disease reaction in the greenhouse, were removed prior to harvest. The remaining plots were harvested in bulk and used as the primary source of breeder seed. A low percentage of variant types, consisting of not more than 1% of plants with long beards are present in Starling; however, Breeder seed of Starling was shown to be genetically stable in the sense that the variety can be maintained and reproduced via seed without changing its characteristics.

ADDENDUM TO PV APPLICATION NO. 9500272, BARLEY, 'STARLING'**Exhibit A: Origin and Breeding History: Selection Criteria**

'Starling' was selected from a composite of six crosses, all of which had C.I. 11550 as a parent. This line was used to introduce tolerance to low pH and aluminum into Virginia barley germplasm. Therefore, this was the primary trait of interest. Other selection criteria used in breeding Starling were resistance to plant diseases, which included leaf rust (*Puccinia hordei*), powdery mildew (*Blumeria graminis* f. sp. *hordei*), net blotch (*Pyrenophora teres*), scald (*Rhynchosporium secalis*), spot blotch (*Cochliobous sativus*), speckled leaf blotch (*Septoria passerinii*), and barley yellow dwarf.

The parent 'Cebada Capa' (C.I. 6193) is a six-row, bearded, spring barley from Argentina that possesses the *Rph7* gene for resistance to leaf rust caused by *Puccinia hordei*, and a gene at the *Ml₆* locus for resistance to powdery mildew (*Blumeria graminis* f. sp. *hordei*). Cebada Capa was used primarily as a source for leaf rust resistance.

Exhibit B: Novelty Statement

During the past four years (1992-95), the average (over 2 to 4 locations) plant height of Starling and 'Wysor' has been identical with values of 39, 43, 37, 37 inches, respectively. Date of head emergence (50% of heads emerged from boot) was identical for Starling and Wysor in 1992 and 1995 (Julian heading date of 110 days), while Starling headed 1 day later than Wysor [L.S.D. (0.05) = 1 day] in 1993 (116 vs 115) and 1994 (112 vs 111).

Starling Barley**14B. Exhibit B: Novelty Statement**

Starling is uniquely different from all known barley cultivars, but is most similar to 'Wysor' barley. Both cultivars are similar in maturity, plant height, and for many morphological characters. Starling differs from Wysor in that it is moderately susceptible to powdery mildew in the seedling stage, while Wysor is completely resistant. Seedlings of Starling are also susceptible to leaf rust race 8, while those of Wysor, which has the resistance gene Rph7, are resistant. Starling, however, has better field resistance to leaf rust race 30 than does Wysor. Starling also is moderately resistant to scald cultures to which Wysor is very susceptible. Starling also appears to have a moderate level of tolerance to low pH and aluminum, while Wysor is quite intolerant.

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SECOND ADDENDUM TO PV APPLICATION NO. 9500272, BARLEY, 'STARLING'

Exhibit B: Novelty Statement

The most indisputable trait for which 'Starling' and 'Wysor' differ is that of major genes governing seedling resistance to leaf rust; Wysor has the resistance gene *Rph7* while Starling does not. Seedlings of Starling are moderately susceptible (infection type = 3; on a 0-4 scale) to Race 8 of *Puccinia hordei* (which does not have virulence for *Rph7*) while those of Wysor are completely resistant (infection type = 0).

With regard to your comment concerning the lack of difference between 'Starling' and 'Wysor' for powdery mildew resistance as presented in Table 1 of the original application:

The data presented in Table 1 is the percentage of leaf area infected with powdery mildew in the adult-plant stage (i.e., after head emergence). Both Starling and Wysor are completely resistant (i.e., no visible sign of infection) to powdery mildew in the adult-plant stage, and it is only in the seedling stage (based on reaction of seedlings to powdery mildew in greenhouse tests) that differences in mildew resistance are observed between these cultivars, with Starling being moderately susceptible (infection type = 3; on a 0-4 scale) and Wysor being completely resistant (infection type = 0).

With regards to your comment concerning head emergence of Starling and Wysor:

In my original Novelty Statement, I cite that both cultivars are similar in maturity, generally heading on the same day (three years @ 10 locations), Starling heading 1 d later (4 years @ 13 locations), and Starling heading 2 d later (2 years @ 9 locations). With protected L.S.D. (0.05) values from ANOVA for heading date of 1-2 d, it would be difficult to unequivocally conclude that Starling and Wysor differ significantly in date of head emergence. Therefore, I do not think this trait can be used to accurately distinguish these cultivars.

SECOND ADDENDUM TO PV APPLICATION NO. 9500272, BARLEY, 'STARLING'
Page 2

With regards to data substantiating a higher level of leaf rust resistance in adult-plants of Starling versus Wysor, the following is submitted⁺:

<u>Year</u>	<u>No. Loc</u>	<u>Leaf Rust Severity % Leaf Area Infected*</u>		<u>Leaf Rust Severity Leaf Area Infected (0-9)*</u>		<u>L.S.D. (0.05)</u>
		<u>Starling</u>	<u>Wysor</u>	<u>Starling</u>	<u>Wysor</u>	
1991	3	7	21			2
1992	1			4	9	2
1993	2	19	44			10
1994	1	1	2			2
1995	3			2	7	2

+ Data taken from Virginia State Barley Trials and analyzed using ANOVA with L.S.D. used to test for significant differences.

*% Leaf area infected = 0-100% leaf area covered; and 0-9 scale; where 0 = No visible signs of infection and 9 = 90% or more of leaf area infected.

From the cumulative data presented here, it is evident that Starling has a significantly higher level of resistance (i.e., significantly lower leaf rust severity) than Wysor. Little difference in leaf rust severity was observed between Starling and Wysor in 1994 because leaf rust became established late in the season.

All disease data originally presented in Table 1 as a % refer to disease severity on a scale of 0-100% leaf area covered. All L.S.D. values were generated via ANOVA.

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
LIVESTOCK AND SEED DIVISION
BELTSVILLE, MARYLAND 20705

EXHIBIT C
(Barley)

OBJECTIVE DESCRIPTION OF VARIETY
BARLEY (HORDEUM VULGARE)

INSTRUCTIONS: See Reverse.

NAME OF APPLICANT(S) Virginia Agricultural Experiment Station	FOR OFFICIAL USE ONLY PVPO NUMBER 9500272
ADDRESS (Street and No. or R.F.D. No., City, State, and ZIP Code) Virginia Polytechnic Institute and State University Blacksburg, VA 24061-0402	VARIETY NAME OR TEMPORARY DESIGNATION Starling

Place the appropriate number that describes the varietal character of this variety in the boxes below.
Place a zero in first box (i.e. or) when number is either 99 or less or 9 or less.

1. GROWTH HABIT:

1 - SPRING 2 - FACULTATIVE WINTER 3 - WINTER Early Growth: 1 - PROSTRATE 2 - SEMIPROSTRATE
3 - ERECT

2. MATURITY (50% Flowering):

1 - EARLY (California Mariout) 2 - MIDSEASON (Betzes) 3 - LATE (Frontier)

No. of days Earlier than } 1 - BETZES 2 - CALIFORNIA MARIOUT 3 - CONQUEST 4 - DICKSON
 No. of days Later than } 5 - PIROLINE 6 - PRIMUS 7 - UNITAN 8 = Barsoy 9 = Boone

3. PLANT HEIGHT (From soil level to top of head):

1 - SEMIDWARF 2 - SHORT (California Mariout) 3 - MEDIUM TALL (Betzes) 4 - TALL (Conquest)

Cm. Shorter than } 1 - BETZES 2 - CALIFORNIA MARIOUT 3 - CONQUEST 4 - DICKSON
 Cm. Taller than } 5 - PIROLINE 6 - PRIMUS 7 - UNITAN 8 = Barsoy 9 = Boone

4. STEM:

Exertion (Flag to spike at maturity): 1 - 0 - 3 cm. 2 - 3 - 10 cm. Anthocyanin: 1 - ABSENT 2 - PRESENT
3 - 10 - 15 cm.

NO. OF NODES (Originating from node above ground)

Collar Shape: 1 - CLOSED 2 - V-SHAPED 3 - OPEN Shape of Neck: 1 - STRAIGHT 2 - SNAKY
4 - MODIFIED CLOSED OR OPEN 3 - OTHER (Specify) straight to gently curved

5. LEAF:

Basal leaf sheath (seedling): 1 - GLABROUS 2 - PUBESCENT Position of flag leaf (at boot stage): 1 - DROOPING
2 - UPRIGHT

Waxiness: 1 - ABSENT (Glossy) 2 - SLIGHTLY WAXY MM. WIDTH (First leaf below flag leaf)
3 - WAXY

CM. LENGTH (First leaf below flag leaf) Anthocyanin in leaf sheath: 1 - ABSENT 2 - PRESENT

6. HEAD:

Type: 1 - TWO-ROWED 2 - SIX-ROWED Density: 1 - LAX 2 - ERECT (Not dense)
3 - ERECT (Dense)

Shape: 1 - TAPERING 2 - STRAP 3 - CLAVATE Waxiness: 1 - ABSENT (Glossy) 2 - SLIGHTLY WAXY
4 - OTHER (Specify) strap and parallel 3 - WAXY

Lateral Kernel Overlap: 1 - NONE 2 - AT TIP Rachis (Hair on edge): 1 - LACKING 2 - FEW 3 - COVERED
3 - 1/4 - 1/2 OF HEAD

7. GLUME:

Length: 1 - 1/3 OF LEMMA 2 - 1/2 OF LEMMA Hairs: 1 - NONE 2 - SHORT 3 - LONG
3 - MORE THAN 1/2 OF LEMMA

Hair covering: 1 - NONE 2 - RESTRICTED TO MIDDLE 3 - CONFINED TO BAND 4 - COMPLETELY COVERED
*Predominantly type 3 but occasionally type 4

Awn: 1 - LESS THAN EQUAL TO LENGTH OF GLUMES 2 - EQUAL TO LENGTH OF GLUMES
3 - MORE THAN EQUAL TO LENGTH OF GLUMES

Awn Surface: 1 - SMOOTH 2 - SEMISMOOTH 3 - ROUGH

8. LEMMA:

- ☒ Awn: 1 - AWNLESS 2 - AWNLETS ON CENTRAL ROWS, AWNLESS ON LATERAL ROWS
 3 - SHORT ON CENTRAL ROWS, AWNLETS ON LATERAL ROWS 4 - SHORT (less than equal to length of spike)
 5 - LONG (longer than spike) 6 - HOODED
- ☒ Awn Surface: 1 - AWNLESS 2 - SMOOTH 3 - SEMISMOOTH 4 - ROUGH
- ☒ Teeth: 1 - ABSENT 2 - FEW 3 - NUMEROUS ☒ Hair: 1 - ABSENT 2 - PRESENT
- ☒ Shape of base: 1 - DEPRESSION 2 - SLIGHT CREASE ☒ Rachilla Hairs: 1 - SHORT 2 - LONG
 3 - TRANSVERSE CREASE

9. STIGMA:

- ☐ Hairs: 1 - FEW 2 - MANY

10. SEED:

- ☒ Type: 1 - NAKED 2 - COVERED ☐ Hairs on Ventral Furrow: 1 - ABSENT 2 - PRESENT
- ☒ Length: 1 - SHORT (8.0 mm.) 2 - SHORT TO MIDLONG (7.5 - 9.0 mm.) 3 - MIDLONG (8.5 - 9.5 mm.)
 4 - MIDLONG TO LONG (9.0 - 10.5 mm.) 5 - LONG (10.0 mm.)
- ☒ Wrinkling of hull: 1 - NAKED 2 - SLIGHTLY WRINKLED 3 - SEMIWRINKLED 4 - WRINKLED
- ☒ Aleurone Color: 1 - COLORLESS (White or Yellow) 2 - BLUE
- ☐ ☐ PERCENT ABORTIVE ☒ ☒ GMS. PER 1000 SEEDS

11. DISEASE: (0 = Not Tested, 1 = Susceptible, 2 = Resistant)

- ☒ SEPTORIA ☒ NET BLOTCH ☒ SPOT BLOTCH ☒ POWDERY MILDEW
- ☐ LOOSE SMUT ☐ BACTERIAL BLIGHT ☐ COVERED SMUT ☐ FALSE LOOSE SMUT
- ☒ STEM RUST ☒ LEAF RUST ☐ SCAB ☒ SCALD
- ☐ AY ☐ BSMV ☒ BYDV ☒ OTHER (Specify) stripe rust

12. INSECT: (0 = Not tested, 1 = Susceptible, 2 = Resistant)

- ☐ GREEN BUG ☐ ENGLISH GRAIN APHID ☐ CHINCH BUG ☐ ARMYWORM
- ☐ GRASS HOPPERS ☐ CEREAL LEAF BEETLE ☐ OTHER (Specify) _____
- HESSIAN FLY RACES ☐ GP ☐ A ☐ B ☐ C
☐ D ☐ E ☐ F ☐ G

13. CHEMICAL (0 = Not Tested, 1 = Susceptible, 2 = Resistant)

- ☐ DDT ☒ OTHER (Specify) Hoelon

14. INDICATE WHICH VARIETY MOST CLOSELY RESEMBLES THAT SUBMITTED:

CHARACTER	NAME OF VARIETY	CHARACTER	NAME OF VARIETY
Plant tillering	Wysor	Seed size	Nomini
Leaf size	Wysor	Coleoptile elongation	Wysor
Leaf color	Wysor	Seedling pigmentation	Wysor
Leaf carriage	Wysor		

REFERENCES: The following publications may be used as a reference aid for the standardization of character descriptions and terms used in this form:

- Wiebe, G. A., and D. A. Reid, 1961, Classification of Barley Varieties Grown in the United States and Canada in 1958, Technical Bulletin No. 1224, U.S. Dept. of Agriculture.
- Reid, D. A., and G. A. Wiebe, 1968, Barley: Origin, Botany, Culture, Winter Hardiness, Genetic Variation, Pests, Agriculture Handbook No. 338, U.S. Dept. of Agriculture. pp. 61 - 84.
- Malting Barley Improvement Association, Milwaukee, Wisconsin, 1971, Barley Variety Description.

COLOR: Nickerson's or any recognized color fan may be used to determine color of the described variety.

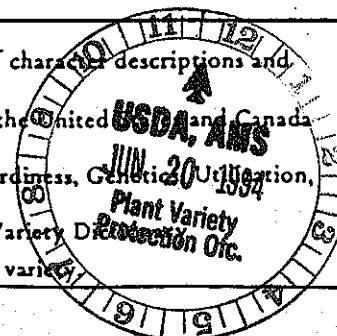


Table 1. Comparative performance of Starling barley in Virginia 1987-1992.⁽¹⁾

	Grain Yield (Bu/Ac)		Test Weight (Lbs/Bu)	
	'90-'92 [16]	'87-'92 [32]	'90-'92	'87-'92
Starling	108	100	47.5	46.0
Nomini	103	98	47.8	46.3
Sussex	88	87	46.7	45.3
Wysor	94	90	48.1	46.8
Boone	86	84	46.9	46.3
Pennco	100	95	47.3	45.6
LSD (0.05)	4			

	Date Headed (Mar 31+) [21]	Plant Height (Inches) [21]	Lodging (%) [25]	Powdery Mildew (%) [6]	Leaf Rust (%) [6]	Net Blotch ⁽²⁾ (0-9) [4]
Starling	23	40	35	0	7	3
Nomini	19	40	26	0	15	2
Sussex	18	39	35	0	31	3
Wysor	22	39	33	0	21	2
Boone	25	40	52	31	25	2
Pennco	23	40	30	0	6	4

⁽¹⁾ The number in brackets below column headings indicates the number of tests on which data are based.⁽²⁾ Disease reaction where 0=resistant and 9=susceptible.

Starling Barley

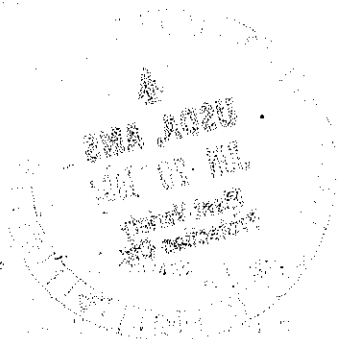
14D. Exhibit D: Additional Description of Starling

Starling is a medium tall, midseason six-row winter feed barley (*Hordeum vulgare* L.) with compact spikes. Spikes of Starling are usually awnless, but occasionally have short, semi-smooth awns on the central spikelets. Early growth is semi-prostrate, penultimate leaves average 19 cm in length and 16 mm in width, and the distance from the flag leaf to the spike is greater than 10 cm. Spikes of Starling are dense, parallel and frequently have overlapping lateral kernels. At maturity, the neck is straight to gently curved and the spikes are nodding rather than erect. The head is slightly waxy; the rachis is tough and covered with hair; and the collar is closed. The glumes of Starling are one-third of the lemma in length and have hairs that generally are confined to the band but occasionally extend to cover the glume. Starling has semi-smooth glume awns that are equal to the glume in length. The yellow lemmas have few teeth on lateral and marginal nerves, with a slight crease at the base. Starling has long, covered, white, semi-wrinkled seed with long-haired rachillas.

Since Starling has not been tested in comparison with any of the seven cultivars listed in Exhibit C, average data on performance in Virginia from 1987 to 1992 are presented in Table 1, which follows this section. Starling also was evaluated for three years (1989-91) in the Uniform Winter Barley Yield Nursery. Performance data for these nurseries are available in USDA nursery reports compiled by Dr. David Livingston at Pennsylvania State University.

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Starling Barley**14E. Exhibit E. Basis of Applicant's Ownership**

The owner of Starling barley is the Virginia Polytechnic Institute and State University, of which the Virginia Agricultural Experiment Station is a part. Employees charged with developing this new cultivar as a condition of their employment understand that ownership rests with Virginia Polytechnic Institute and State University pursuant to university policy on intellectual property.

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